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THE CHANGING ROLE OF THE KENTUCKY MOUNTAINS AND THE PASSING OF THE KENTUCKY MOUNTAINEER

D. H. DAVIS
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THE KENTUCKY MOUNTAINS DURING THE COLONIAL PERIOD

French and English colonial occupation of the North American continent differed greatly in character. The English settlements, confined to the seaboard, were primarily agricultural; fur trading and other pursuits were incidental, carried on to supplement agriculture, largely in areas where soils were thin or poor. French occupation was very different; settlement early spread over a vast area, fur trading rather than agriculture being the dominant interest. The voyageur replaced the isolated farmer—the fur trading post, the village of the English colonists.

It is not sufficient to explain this difference in the character of occupation on the basis of difference in racial aptitude. Doubtless the French voyageur was able to maintain more friendly relations with the Indians than was the English colonist. His habits of life and his practice of intermarriage cemented Indian friendships. In addition, his method of obtaining a livelihood did not threaten the economy of the Indians. The English farmer, by his clearing and cultivation of the land, deprived the Indian of a means of support, which engendered hostility. This difference in occupation, which in large part explains the strained relations between the English colonists and the Indians, was not, however, related to differences in the racial aptitudes of the French and English colonists. It would be difficult, if not impossible, to prove that the Frenchman is an adventurer, an explorer and a lover of the wilderness, whereas the Englishman is a tiller of the soil, rather the reverse is true. Differences in the character of the settlements were the result of the physical build of the North American continent. First obtaining a foothold in rather high latitudes, where the soils are comparatively thin and for the most part poor, with long cold winters, with ease of penetration and communication

afforded by the waterways, the destiny of French colonial enterprise was virtually assured. The English colonies, on the other hand, were hemmed in on the west by a topographic barrier, the heavily forested parallel ridges of the Appalachians and the maze of ridges and valleys of the dissected Alleghany-Cumberland Plateau, a barrier which has proven difficult down to the present and which was, in colonial days, virtually impassable. The Kentucky Mountains comprise a portion of this barrier which imposed itself between the Atlantic seaboard and the fertile areas of the Mississippi Valley.

TOPOGRAPHY AND SOILS OF THE KENTUCKY MOUNTAINS

Physiographically, the Kentucky Mountains represent a maturely dissected plateau, with the crests of the ridges which represent the remnants of the former even plateau surface, rising from an average altitude of about 1,000 feet above sea-level at the Ohio River to an average elevation of 2,000 feet above the same datum plane at the Tennessee border. Five large rivers, the Big and Little Sandy, the Licking, the Kentucky and the Cumberland rise in the plateau. Many of these streams have tributaries of considerable size. The region is covered with a network of rivers, creeks and forks which head against one another on opposite sides of the ridges, which constitute the divides between the drainage basins.

These ridges, which in general have rather an even sky line, form a complex network over the major portion of the area except in the southeast, where Cumberland and Pine mountains parallel one another in a N. E.–S. W. direction, ten to twelve miles apart. Whereas, over most of the area the strata are practically horizontal with only a slight dip to the southeast, in both these ranges the strata are highly inclined. The Cumberland Range presents a steep face, broken in few places, to the Virginia side; the steep face of Pine Mountain is to the northwest. Between these two parallel ridges, the Black Mountains, a mass of ridges and spurs, reach a maximum elevation of slightly over 4,000 feet.

The character of the valleys is determined by the geological formation. Where hard conglomerate ledges interspersed with shales outcrop, castellated forms are numerous and the valley sides often rise sheer from the valley floor several hundred feet, frequently making communication from valley to valley across the ridge almost impossible. Such a topography is well developed in

Rockcastle County, in the area drained by the Rockcastle River, both the county and the river deriving their names from the castellated forms which abound. Along such valleys, the conglomerate layers frequently overhang and form rock houses and waterfalls occur in the stream courses. Recent investigations have shown that these caves were utilized by prehistoric man as dwelling places.

Over the greater portion of the area, the rivers and creeks are bordered by alluvial deposits of considerable width and the valley

FIG. 1. A creek bottom farm in the Kentucky Mountains, Wolfe County. The even sky line of the ridges shows in the background

walls rise steeply but not precipitously. The bottoms, which lie on alternate sides of the rivers, as the stream swings from side to side of the valley, usually afford a considerable amount of level land along the larger streams. Along the smaller creeks, the bottoms are limited in extent and decrease rapidly in width upstream.

The width of the ridges varies greatly. In the areas of conglomeritic outcrop, ridges are frequently of considerable width, but wherever stream dissection has progressed far, the ridges are narrow and the stream valleys expand in width.

Soils on the ridges are derived from the conglomerates and are, as a rule, thin and sandy. They are not retentive of moisture, and as shown by chemical analysis and crop yield, their content of

plant food is low. These ridge lands form very poor agricultural areas. Soils are thin and rock outcrops are not uncommon. Crops suffer severely during dry weather on the thin, sandy, infertile soils.

Soils in the valleys and on the adjacent slopes vary considerably in character. Where derived from shales, they are clays; on the slopes, these soils are thin and wash badly, so that the life of a field under cultivation seldom exceeds three or four years.

FIG. 2. Travel up the small creeks is difficult. The bottoms are narrow and in crops; the roads are in the creeks. Meatscaffold Creek, Breathitt County

In the valleys, the soils are alluvial in character and highly desirable, particularly where the rivers have cut thru to limestone, but these areas are not numerous.

MOVEMENT OF POPULATION INTO THE MOUNTAINS

The area has always been difficult of access. Until the last decade of the eighteenth century, there was no settlement in the mountains, which were viewed only as a barrier to be passed on the way to the west.

The Wilderness Road, by way of Cumberland Gap and the break in Pine Mountain at Pineville, where the Cumberland River cuts thru, served as the principal highway over which poured the early flood of settlement into the agriculturally more desirable

areas of central Kentucky. From this incoming tide of population, a few settlers detached themselves and occupied the more desirable and larger creek bottoms, but the majority pushed on, as the area in general did not appeal to them. The larger number of settlers moving down the Ohio River or coming in by the northern overland routes also passed by the eastern portion of Kentucky as did those coming in by the southern route. Tho girt by roads leading to the west, early settlement in the mountains was sparse; settlers representing, for the most part, those who dropped out on their way to areas farther to the west.

At a later date, when the wave of transmontane immigration had spent itself, settlement pushed in from the west, but here also penetration of the mountains was difficult. Only where the rivers had frayed the west fronting conglomerate escarpment was access possible. Until late in the history of the state, no railroads penetrated this western barrier and wagon roads east of it were, almost without exception, poor. Even today, railroads and roads enter only where main drainage lines have breached the barrier. The consequence of this topographic condition has been, that at both an early and a late date, movement into and thru the mountains and communication with the outside world have been hampered. This has been the cause of the retardation which is disappearing so rapidly.

Distribution and Increase of Population

From the beginning, population was widely diffused, occupying the bottoms of the larger creeks. At an early period, and to the pioneer, there was much that was attractive. The slopes were heavily timbered and game was abundant; the alluvial soils of the bottoms afforded sufficient level land to raise abundant crops of corn. With the increase in population between 1840 and 1900, which was almost entirely genetic, population began to press heavily on the limits of sustenance of the area. As the population increased and movement up the creeks occurred, even the exceedingly rough country of the Upper Cumberland and Kentucky basins was occupied. By 1900, the density of population was everywhere from 18-45 to the square mile, virtually all a rural population. For a period of one hundred years, the isolation of the area was accompanied by the agricultural occupation of the land. The exploitation of the timber resource was possible in only a very limited way, and of the coal, in even lesser degree.

Every farmer was practically self sufficient. The population was of fair density and the density increased with each decade, but development was retarded by isolation.

CHARACTER OF THE POPULATION

Early settlers in the mountains were virtually all of American birth and American parentage, and mostly from southern states. The stock is in all probability in large part the same as that of the Blue Grass, but it has been modified by long isolation in an area of lesser desirability. The transmontane settlers grew in wealth

FIG. 3. Many miles of good roads are now being built in the mountains. This is a view of a portion of the Old Wilderness Road in Bell County near Cumberland Gap

and culture, but in the mountains, deterioration began as soon as population commenced to press upon the limits of sustenance. In addition, the lawless flocked to the mountains and reproduced their kind. Relief was not afforded by emigration because, shut in by the mountains, ignorance of opportunity elsewhere prevailed. In addition, the mountaineer is strongly attached to home and kindred; the hard life of the mountains bred shiftlessness; and poverty prevented escape from the area.

Altho genealogical records are lacking, names and survivals in language and customs indicate an English and Scotch ancestry with a certain admixture of Germans and Hugenots. In consequence of the genetic increase of the population and the absence

of immigration, the ethnic type has been preserved and the population is of extraordinary homogeneity. Even the physical characteristics are common. Coming from the same stock, intermarrying to a degree almost unknown in any other part of America, and leading the same type of life, this is in no way remarkable. The average mountaineer is lean and lank with rather high cheek bones and an inexpressive face, which effectually conceals whatever he may feel or think.

ADJUSTMENTS OF THE POPULATION TO THE PHYSICAL EQUIPMENT OF THE AREA

Thrown entirely on their own resources by isolation, living conditions were adjusted to the limited opportunities of the area, consequently pioneer conditions prevailed for a much longer period than elsewhere in North America. The older homes are of roughly squared and fitted logs with fireplace and chimney of sandstone slabs, quite often laid with mud in place of mortar. Roofs are of hand split shingles or "boards." In many cases, windows are lacking, ample ventilation being secured thru the chinks between the logs.

Outbuildings are commonly few or lacking; hay is stacked in the field; corn is kept in a small crib or fed directly from the field; stock runs in the open except for a very limited portion of the year. Outbuildings other than a few sheds are, therefore, unnecessary.

Domestic conveniences are still few in the mountains. Up to a few years ago, furniture was largely of local manufacture. Kitchen utensils were limited to a frying pan, an iron pot, a bucket, a coffee pot and a few tins supplemented by gourds of various sizes and shapes. Tho the day has passed when the women "battle the clothes in the stream," washing is still a laborious process, carried on out of doors by the side of the creek in the summer.

On the farm, little machinery is used. Scythes, cradles, flails, and wooden harrows with locust wood teeth, still are in common use. In the preparation of the land, the bull-tongue plow is ordinarily used, tho sometimes the ground is simply "drug" with the branch of a tree. The hominy block and the handmill have practically disappeared and the old water mills are likewise being displaced.

Not only has the mountain environment left its impress on the activities of the community, but it has left as well its stamp on the

FIG. 4. On the Wilderness Road near Pineville—old log house with frame addition. Chimneys are constructed of sandstone slabs

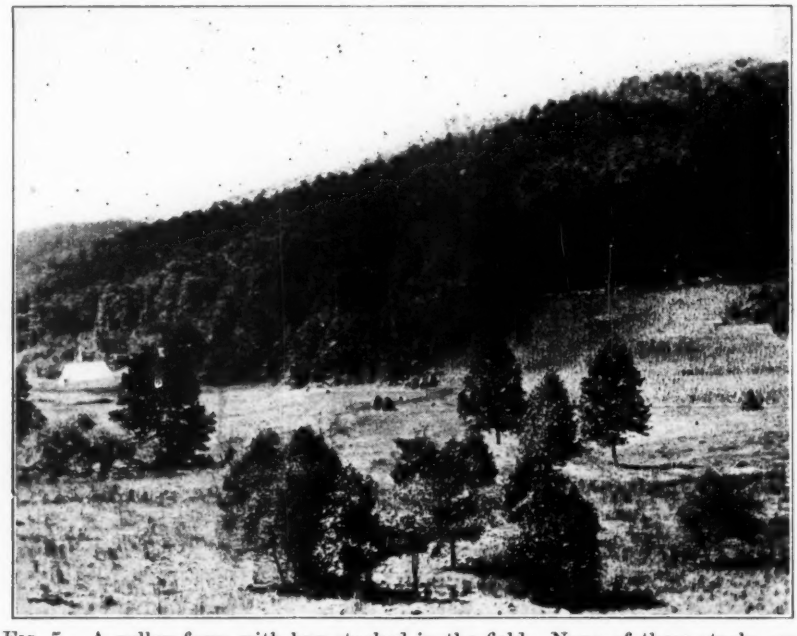

FIG. 5. A valley farm with hay stacked in the field. None of these stacks are over seven or eight feet in height and all are secured by poles. Valley of Greasy Creek, west of Pine Mountain, Harlan County

nature and mental processes of the mountaineer. The self reliance made necessary by isolation has developed an independence which manifests itself in a disregard of revenue laws and a disposition to avenge wrongs without recourse to processes of law. The average mountaineer is unable to appreciate the binding force of a contract and is almost unaware of the value of time. In the monotony of their lives, small events assume great importance.

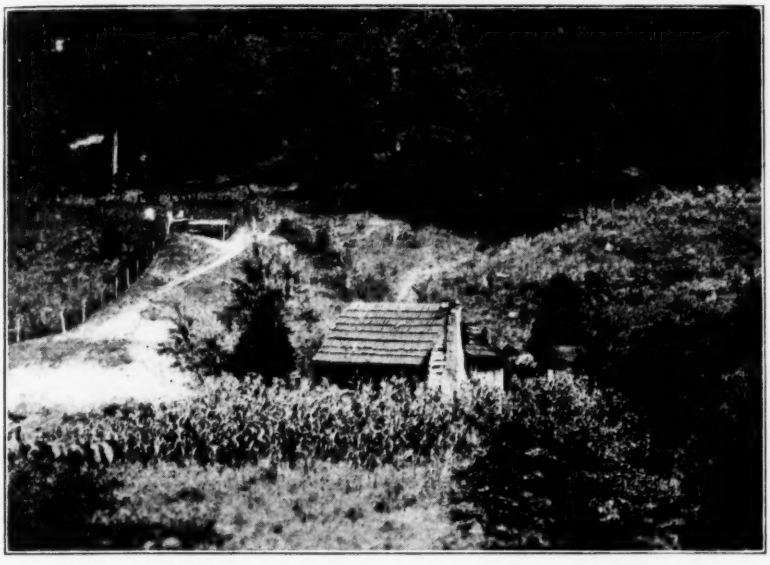

FIG. 6. Home at head of a cove, Perry County. Burying ground at left and abandoned field at right in the background. Corn in foreground. The soils are derived from shales

Strangers excite curiosity, even today, in all areas far from the beaten trail.

It was literally true a few years ago that the Mountains were "a backwoods where the civilization is that of the eighteenth century—where money is as scarce as in colonial days, and all trade is by barter" and that in 1878, Shaler, of the Kentucky Geological Survey, saw men hunting squirrels with old English "short bows," but these are things of the past, not of the present. Most of the literature extant on the mountains conveys an entirely erroneous impression of present day conditions.

CHANGE IN THE KENTUCKY MOUNTAINS

The development of the coal resource has resulted in the superimposition of twentieth century industrialism upon a community of self sufficing households. This has been accompanied by pro-

found changes, the amount and character of the change being determined by the extent to which the coal resource has been developed and the type of coal mining operation. Where development has been extensive, the land has in many cases passed completely out of agricultural use. In almost all parts of the mountains, the influence of the mines has penetrated; only in the remoter coves at the headwaters of the Kentucky, are conditions essentially static.

Few foreigners entered the mountains prior to railroad construction, and up to 1900 there were relatively few Negroes in the mountains. The small mountain farm did not require slave labor

FIG. 7. The main street of Middlesboro, Bell County

and the hard conditions of life and lack of opportunity for domestic service made the area unattractive to free Negroes. In addition, the mountaineer has never taken kindly to Negroes in the community. At present, however, both foreigners and Negroes have appeared in all areas where extensive mining operations are carried on and in the urban centers which are springing up in response to the needs of the mining communities.

THE FUTURE OF THE MOUNTAINS AND THE PASSING OF THE MOUNTAINEER

The Kentucky Mountains, altho settled at an early date, constitute the largest and only undeveloped area in Kentucky that holds forth great promise for the future. In no other portion of Kentucky is change occurring with more rapidity, yet the meta-

morphosis which the next half century will witness has as yet only begun.

For nearly one hundred years the mountaineers have been immured in their mountains, shut in on the east by the Pine and Cumberland mountain barrier and separated from the Blue Grass on the west by the frowning escarpment of the Basal Coal Measure Conglomerate. Amid their mountain surroundings, the mountain people have multiplied in numbers, meanwhile wringing a bare existence from the narrow bottoms and unfriendly slopes. Cut off

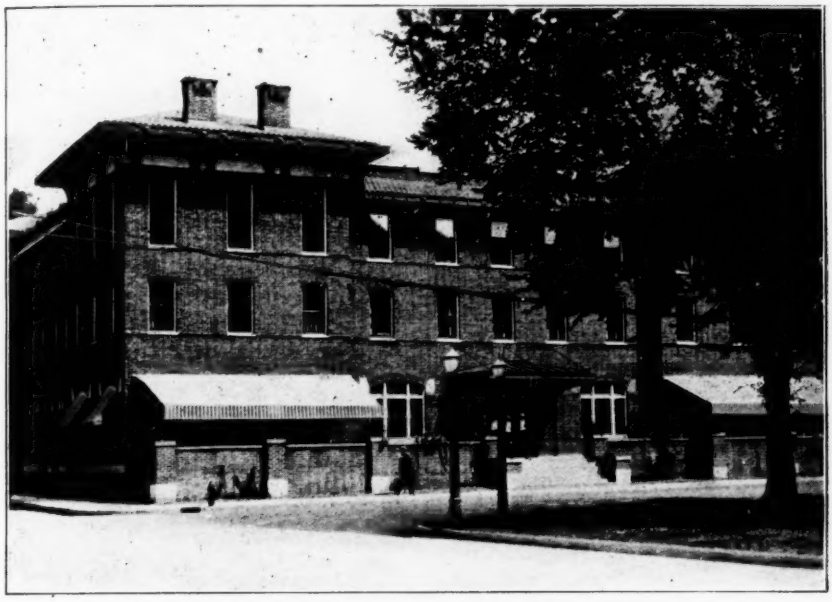

FIG. 8. The hotel at Pineville, Bell County

from the outside world, change penetrated slowly or not at all, so that this group of people perpetuated the customs and expressions of a by-gone day. In the mountains, up to 1890, lived "our contemporaneous ancestors."

The interesting characteristics of the population, with their eighteenth century customs and peculiarities of speech, have long intrigued the imagination of the outside world to such an extent that it has been difficult to dissociate the mountaineers from the mountains. It has come to be accepted almost as a truism by many people that this is a country of little opportunity because of its past performances, whereas the reality is far different. Few areas are more highly endowed by nature than the Kentucky Mountains. To the individual who must have level farm land with black prairie

soils, who cannot appreciate any area which will not grow bumper crops of corn, the mountains promise little, but tho in an agricultural way the area holds forth but slight promise, the great mineral wealth and its possibilities as a reservoir upon which the prairies may draw for lumber, make up for the agricultural deficiencies.

This area has not as yet been despoiled, except in small part; it still possesses resources of great value. Old in point of time of settlement, the area is young in the stage of development. The problems which confront it are those which face every young and rapidly developing area, the problem of conserving the assets with which the region is endowed, which implies a wise utilization of the resources.

The old order passes and with the passing goes one of the most picturesque figures in the field of American fiction, the Kentucky Mountaineer. Adjustment to new conditions must be made, and with this adjustment, all the romance attached by fiction to the person of the Kentucky Mountaineer disappears and he becomes only another member of the modern industrial world.

THE SCANDINAVIAN PENINSULA

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AREA AND POPULATION

The Scandinavian Peninsula, which consists of Norway and Sweden, has an area of about 300,000 square miles and a population of approximately 8,600,000. Comparing these figures with the area and population of one of our well known states, it is found that the peninsula has an area of about seven times that of Pennsylvania with practically the same number of people.

The density of population of the Scandinavian Peninsula is about one-fourth that of the continent of Europe (Fig. 1). The map showing the distribution of population in Europe indicates that all of the Scandinavian Peninsula, except the southern and southeastern sections, is sparsely settled. Why has the Scandinavian Peninsula remained so thinly populated when many parts of Europe have become almost overpopulated?

INFLUENCE OF LOCATION

The location of the Scandinavian Peninsula has had a positive and a negative influence upon the settlement and development of

the region. The peninsula is at the northwestern edge of Europe. Due to the fact that the southern part of the peninsula is near the great industrial countries of Europe, southern Norway and southern Sweden are well situated in respect to trade with these countries. The peninsula faces the Atlantic Ocean and the New World. Since many of the trade routes of the world extend between western Europe and the Americas, it can easily be seen that Norway and Sweden have excellent locations for carrying on trade with the Western Hemisphere. Likewise, ocean commerce may be carried on with other parts of the world.

The peninsula is separated from densely populated Europe by a narrow stretch of water, and where it joins Europe in the north, the land is not adapted for settlement. Hence, the region is furnished a certain security from invasions such as is not found in

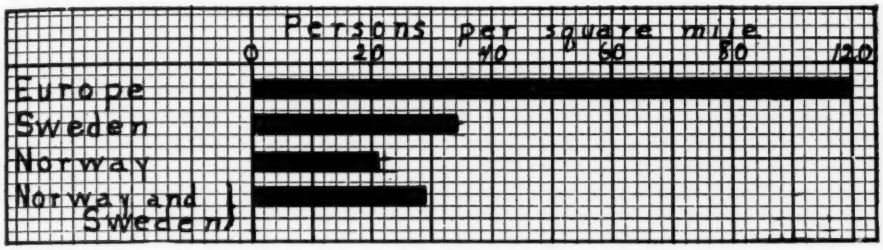

FIG. 1. Density of population of Europe and the Scandinavian countries

many of the other European countries. Another very important point from the standpoint of peace, but not from trade, is the fact that the peninsula does not lie between great industrial areas nor is it on the thorofare to regions which are sought after by strong European nations. Unlike the Balkan countries which lie between the countries of central Europe and Asia, Norway and Sweden are at the end of a thorofare and nothing of much importance lies to the north. While the Balkans have been repeatedly swept by armies, chiefly because these countries are on the crossroads between Europe and Asia, the two Scandinavian countries have had nothing like this to fear since the polar region lies beyond.

The peninsula is in high latitudes, all of the region being north of 55° N. L. When it is realized that the area lies in the same latitudes as Alaska and northern Canada, and that very few people are found in Alaska or in that part of Canada north of 55° N. L., this northern location can be easily grasped. However, generalizations must not be drawn too hurriedly. The warm Gulf Stream,

which later takes the name of the North Atlantic Drift, flows northeast and passes the west coast of the peninsula. Due to this warm drift and to the winds from a westerly direction, the west coast of Norway does not have extremely cold weather. Farther inland, the effect of latitude on climate is more noticeable and much of the region is too far north for extensive human activities.

RELATION OF SURFACE TO THE DEVELOPMENT OF THE COUNTRY

Only about 7 per cent of the Scandinavian Peninsula is under cultivation, while a little more than 50 per cent is considered unproductive at the present time (Fig. 2).

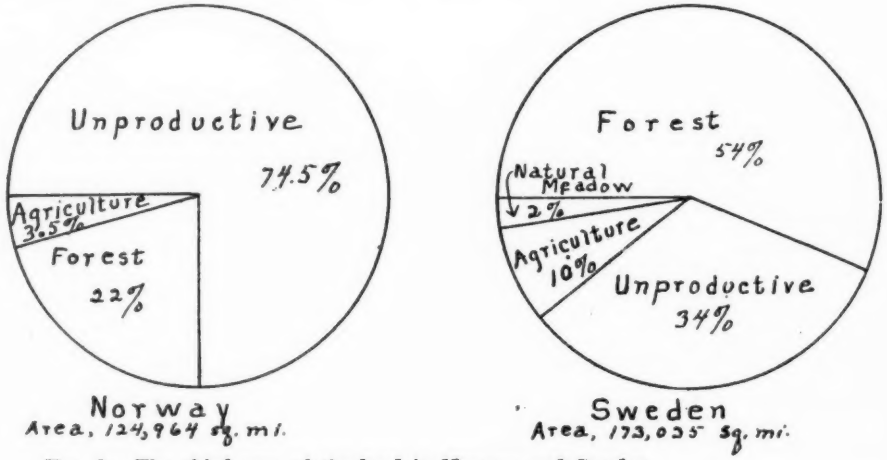

FIG. 2. The chief uses of the land in Norway and Sweden

Agriculture is not extensively developed, chiefly because the climate and much of the land are not favorable for the production of a great variety of crops.

A large part of the Scandinavian Peninsula consists of an ancient mountain and plateau region whose average height is about 3,000 or 4,000 feet above sea-level. The region was the center of the ice sheet during the Great Ice Age. The mountains were worn down by the ice, much of the loose and less resistant material was removed, and the bare rocks were left exposed in many places. In the north the crest of the mountains reminds the fishermen of the keel of an upturned boat, hence the name Kiolen Mountains. In the southern part of Norway are many mountain ridges rising above the general level of the plateau. They are called fields, Dover Field being one of the more prominent ones. Permanent

ice fields are found in the form of glaciers in several places on the high western slopes. The lower levels of the plateau are usually covered with forests, but much of the higher lands are bare of vegetation.

The highest part, or the backbone of the plateau, is near the western side of the peninsula. Norway is more mountainous than Sweden. The western edge slopes very suddenly to the Atlantic Ocean while the eastern edge descends to the Gulf of Bothnia by a series of wide, gently sloping terraces or steps. The western coast of Norway, like the coast of British Columbia in North America, is highly fiorded. The coast of Norway is one of the best examples of a fiorded coast in the world (Fig. 3). The valleys leading down to the sea were deepened by the glaciers, the land sank and the ocean entered the mouths of the rivers. There are many good harbors. Some of these narrow inlets or fiords extend back into the land for approximately 100 miles. In many places the land did not sink low enough for the water to cover the highest parts and islands were formed. It is said that there are in the neighborhood of 150,000 islands along the coast of Norway.

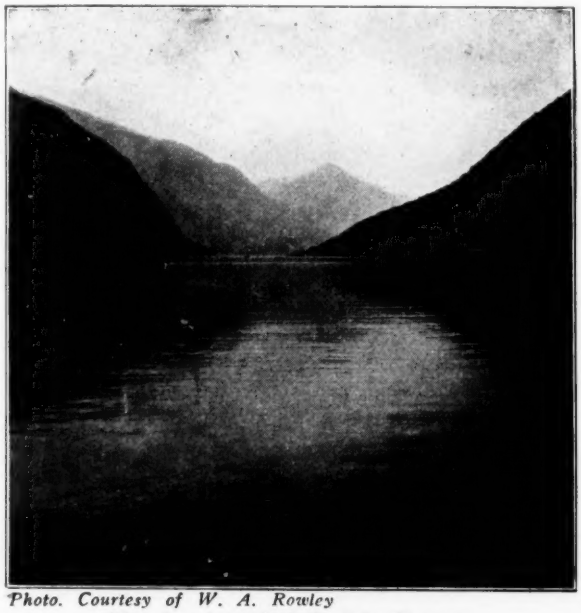

Photo. Courtesy of W. A. Rowley

FIG. 3. A typical fiord in Norway

The eastern coast of Sweden is relatively smooth when compared to that of Norway. The mouths of the rivers furnish good harbors and there are a number of islands off the coast.

Much of the peninsula of Scandinavia is composed of the old crystalline rocks which were left exposed by the glaciers. These rocks have not weathered rapidly enough to form much soil, so a large part of the area has poor soil or practically no soil. The glaciers deposited clay and gravels in the eastern and southern

parts of the peninsula and in a few scattered places which form fairly good agricultural land. The southern part of Sweden belongs to the great central plain of Europe.

The agricultural land in Norway is found in narrow strips such as the limited lowlands in some of the fiords, the valleys along the rivers and lakes, and the area around Christiana. In Sweden the best farm land is found in the southern one-fourth of the country, the most productive land being in the extreme south and around the great lakes where the lowlands have a rather fertile soil.

INFLUENCE OF CLIMATE

The Scandinavian Peninsula has its climate determined chiefly by elevation, winds, nearness to the Atlantic Ocean and latitude. The winds blow in general from a westerly direction from over the warm North Atlantic Drift. They strike the western coast of Norway and give the region an oceanic type of climate with mild, moist winters and cool, moist summers. All the harbors along the western coast are open during the winter. The precipitation varies from 40 to 60 inches on the southern coast of Norway, to about 80 inches on the west coast around Stavenger, to 50 to 60 inches in the northwest near the Lofoten Islands.

On the leeward or eastern side of the highlands, the influence of the ocean is not so noticeable and Sweden has a continental type of climate. However, the Kiolen Mountains are not broad or high enough to keep northern Sweden from being influenced somewhat by breezes from the Atlantic Ocean. Again, the Gulf of Bothnia influences the climate to a certain degree. The range of temperature is greater in Sweden than in Western Norway. The summer is warmer and the winter is colder in Sweden than in western Norway. Most of the rivers in Sweden are frozen during a part of the year while the harbors on the Gulf of Bothnia are closed by ice for several months each year. The temperature decreases from south to north in Sweden more than it does along the west coast of Norway. Sometimes cold northeast winds blow from northern Finland. Naturally the high plateau has very cold winters.

The part of the peninsula on the leeward side of the mountains receives less precipitation than western Norway. The annual range of precipitation is from about 35 inches in southwest Sweden to less than 15 inches in the north, the yearly average for Sweden being about 20 inches.

Since the Scandinavian Peninsula is in high latitudes, the number of hours of daylight is long in summer and short in winter. Since a part of the region extends beyond the Arctic Circle, it follows that in the north the sun will be above the horizon for a certain number of days in summer and below the horizon for a certain number of days in winter. The "midnight sun" is common in northern Scandinavia and this is one of the attractions for tourists from low and middle latitudes. At Tromso in Latitude 69° north, the sun is above the horizon for 64 days during the year. The long hours of daylight make up somewhat for the short growing season. Plants mature sooner in the north where the number of hours of daylight is long, but only the hardier cereals and crops can be grown. For example, barley will grow and ripen in about eight weeks in the extreme north while in the south it takes about five or six weeks longer. Oats cannot be grown as far north as barley, while wheat can be grown only in the southern part of the peninsula.

Agricultural Products

On account of climate and soil, the Scandinavian Peninsula is not a great agricultural region and it will never be able to raise food for a large number of people. At the present time somewhat less than one-half of the people are engaged in agriculture. The hardy cereals such as oats, rye, barley and wheat; sugar beets and potatoes; fodder-roots for animals; and hay make up the chief farm crops. Hay is obtained from almost inaccessible places in the highlands and is brought down by laborious means to the lower lands. Norway and Sweden do not raise enough food for their population, so considerable food products are imported.

In the southern part of the peninsula dairying has become important. Meat and dairy products are exported.

Fishing

Activities connected with the sea and the forests are associated with the Scandinavian Peninsula. Norway is noted especially for fishing and shipping. This is due chiefly to (1) the bold, rugged, deeply indented coastline which furnishes many good harbors for vessels, (2) the poor hinterland or tributary area to the coast which is not adapted for extensive agriculture, (3) the cool, moist climate which is not favorable for a great variety of crops, (4) the

nearby forests for the building of wooden vessels, (5) the great fishing grounds opposite Norway and (6) the excellent location of Norway for carrying on commerce with the rest of the world.

An inviting sea and a repelling interior forced many of the people of Norway to look to the sea for their living, as similar conditions forced many of the settlers of New England to do likewise for many years. From very early times the Norwegians were daring sailors. The calm waters between the islands and the coast and in the fiords were the training grounds of the Vikings of old, just as they are the nurseries of the Norwegian sailors of today. The word Viking means "a frequenter of viks" or "A Son of the Calm Water." The Vikings crossed from the Scandinavian Peninsula to Greenland and reached the eastern coast of North America. They are thought to have gone at least as far south as New England.

According to statistics, about six per cent of the population of Norway is engaged directly in fishing. However, this figure does not indicate the total number of people employed in the fishing business. Many of the people who are not classed as fishermen eke out their living by fishing. Again, the fishing industry gives rise to other activities such as rendering oil and canning fish products.

Fish and fish products make up about one third of the total annual value of the exports of Norway. The chief fishing centers are Aalesund, Christiansund, Tromso, Hammerfest and Honningsvagg.

The herring, on account of its abundance, is the most important kind of fish caught. Fishing for herring is carried on during most of the year along some part of the Norwegian coast; but the locality where the fish is caught depends upon the season. Steamboats and motor boats, generally carrying crews from eight to fourteen men, are used in the herring fisheries. Many of the herring are dried, salted and smoked while others are canned.

In a typical canning factory in Trondhjem the herring are dumped on wooden tables. Here they have their heads removed. The fish are then carried to a large vat filled with salt water. They are cleaned of blood and loose scales and are slightly salted. Then they are taken from the vat and carried to a place where the workers put them on wooden trays with wire bottoms. The trays

of fish are piled about five feet high and are hauled by means of trucks to a steam cooker where they are steamed and cooked for about five minutes. After being cooked, the fish are taken to a place where they are rapidly dried by means of currents of warm air. Now the fish are taken to long tables where the workers pack them in cans, partly filled with olive oil which has been flavored with ground cloves and bay leaves. The tins are collected, inspected and the covers put on them by means of machinery. They are now put in a sterilized oven where steam is applied for about thirty minutes. Then the cans are cleaned, labeled or wrapped in oiled paper with an opener and packed in wooden boxes for shipment. Stavanger is the leading center for the fish canning industry, altho there are canneries at other coast cities.

The catching of whales, seals, walruses and polar bears is of some importance in the Arctic Ocean, especially around Spitzbergen. The seals are killed by shooting. The fat of the seal is taken to some Norwegian port to be made into "tram oil." The oil has been sold chiefly to the United Kingdom since the World War. The smaller size seal skins are generally exported to the United States where they are made into coats. The large seal skins are usually exported to various countries where they are manufactured into leather goods.

Sweden carries on some fishing but the industry is not nearly so important as in Norway.

SHIPPING

In proportion to its population, Norway is the leading seafaring nation in the world. During the World War, Norway lost some 8,000 ships with a capacity of more than 1,000,000 tons. The commercial life of the country was seriously interrupted.

During 1922-23 Norway ranked seventh in total gross tonnage of sailing, steam and motor vessels. Since Norway does not furnish much material for exports nor since the country does not import a large quantity of products, the Norwegian vessels are engaged chiefly in carrying the commerce of other nations. The imports of Norway greatly exceed the exports, hence shipping is one of the principal ways of overcoming the handicap in the balance of trade. The income brought in by the ships more than equals the difference between the values of the imports and exports.

Sweden ranks somewhat lower as a carrying nation than Norway, yet the country does a rather large amount of shipping according to its population. The imports of Sweden slightly exceed the exports.

FORESTS

More than one-fifth of Norway and one-half of Sweden are covered with forests. In the southern part of the peninsula are found deciduous and mixed deciduous and coniferous forests, but elsewhere are forests of pine, fir and spruce. In the tundra region of the north and on the high plateaus there are no forests. The future of Sweden depends to a great degree upon the scientific management of its forests. The same is true of Norway to a less extent.

The forests of Sweden are well situated in respect to water transportation. The eastward flowing streams float the logs down to the sawmills during the spring and early summer. The melting snows help to furnish the water to the many streams. The sawmills are usually on the coast so that the lumber and other forest products may be loaded directly on ocean vessels.

The principal products of the forests of Norway and Sweden are lumber, wood pulp, paper, firewood, tanbark, charcoal and tar. Forest products comprised more than one-half of the total value of the exports of both countries in 1922. Sweden is the greatest wood exporting country in the world. A large variety of products are made from wood. The Swedish match is known all over the world.

Norway and especially Sweden have become great exporters of wood pulp. Some paper is also exported. The reasons for the wood pulp industry are (1) The great abundance of coniferous forests suitable for wood pulp. Many inferior or small trees unsuitable for lumber furnish good material for pulp. (2) The numerous streams for floating the logs down to the pulp mills, for furnishing hydroelectric power for operating the mills and for for furnishing clear, pure water for making the pulp. (3) The great demand for wood pulp and paper thruout the civilized world by nations that are unable to supply their own demands. The Scandinavian Peninsula is well situated for sending wood pulp to any part of the world where it is needed, especially to the United Kingdom and northwestern Europe.

MINERALS

The minerals of Norway are of little importance. There is no coal and the country ranks very low in mineral resources in comparison with the rest of Europe. A small amount of silver, copper, pyrites, iron and nickel is produced.

Altho Norway has no coal and very few minerals, yet the country has access to large coal reserves and other minerals in Spitzbergen. Norway was given control of the Spitzbergen group of islands by the Allied and Associate Powers in 1919. These islands are some 400 miles north of Norway, but the climate is modified by the warm Atlantic Drift. Norway has established on the islands wireless, meteorological and fur stations. Regular navigation is maintained between Spitzbergen and Norway. The most important mineral in Spitzbergen is coal, some of which is of very high grade. The coal is mined on a small scale. Other minerals known to be present are iron ore, copper, zinc, asbestos and gypsum. Probably petroleum also exists.

Sweden has large reserves of high grade iron ore, the country having twelve per cent of the iron ore reserves of Europe. There are two main districts, one being north of the Arctic Circle in Lapland and the other in south central Sweden northwest of Stockholm. About two-thirds of the ore mined comes from the Lapland district. Most of the ore mined in Lapland is exported to Germany and the United Kingdom. During the season of open navigation, the ore is shipped from the port of Lulea on the Gulf of Bothnia. When the port is closed by ice in winter, the ore is sent by rail west to Narvik, an open port on the Norwegian coast. The railroad is operated by electricity.

Some of the iron ore produced in south central Sweden is used in the iron and steel industry in Sweden. Sweden was once the leading iron producing country in the world, but when coke began to be used in place of charcoal, the iron and steel industry became more important in the United Kingdom, the United States, Germany and other places where coking coal is found. Sweden has very little coal. Iron ore is taken to the coal centers in Europe just as it is in America. Without cheap coking coal, Sweden could not hope to remain one of the great iron and steel centers of Europe. Some charcoal is used in Sweden in smelting iron and in producing a very high grade of steel. Where high quality is

desired, Swedish iron and steel take a prominent place and the excellence of its metals is known thruout the world. Cheaper grades of steel for rails, structural purposes and other uses are imported. Some iron and steel are produced in the electric furnace and there is great hope that the electrical production of iron and steel will assume great importance in the future.

A small amount of coal and peat are found in southern Sweden and about one-half million tons of coal were mined in 1919. Other minerals mined on a small scale are silver, lead, copper, zinc and pyrites.

WATER POWER

Since the Scandinavian Peninsula is so poor in coal, the lack of cheap fuel is a serious handicap in the development of industries. Both Norway and Sweden have the means by which they may partly or wholly overcome this difficulty. The white coal or water power which is now going to waste may be set to work in turning the wheels of industry (Fig. 4). This is gradually being done and Norway and Sweden rank among the leading countries of the world in developed water power.

Photo. Courtesy of W. A. Rowley

FIG. 4. One of the numerous waterfalls of the Scandinavian Peninsula

Norway has great hydroelectric possibilities. It has been estimated that at least 5,500,000 horsepower can be commercially developed in this country. At the present time only about one-fourth of this amount is developed. In other words, the country of Norway has harnessed just about the same amount of water power as the state of New York.

The west coast of Norway is probably as well favored for the development of water power as any region in the world. The plateau back from the coast contains lakes to act as reservoirs for the melting snows and the rather heavy rains. Since the rugged plateau reaches the ocean, the streams have many falls near the coast. The electricity may be generated in coast cities where factories might be easily built. The fiorded harbors offer ample opportunity for raw materials to be imported and the finished products to be exported. Some people believe that the coast of Norway would be an excellent location for the manufacture of cotton goods.

Sweden, while having a large amount of undeveloped water power, is not so favored in respect to water power as Norway. Many of the streams have a small volume in summer. Some of the falls are not near the coast and many of the power sites are in the north where the land is not well suited for human abode. At the present time, Sweden has developed almost as much water power as Norway.

Various kinds of electrical machinery are used in Norway and Sweden. The electrochemical and electrometallurgical industries have received considerable attention. The principal chemical products made in Norway are compounds of nitrates. Nitrogen is obtained from the air and is united with other elements. The extraction of metals by means of electricity is done in certain places. The future importance of Norway and Sweden depends largely upon the efficient use of water power.

Cities and Transportation

There are no large cities in the interior of the Scandinavian Peninsula. In Norway, small groups of people are collected along the coast and in the few fertile places elsewhere. Christiania,* Bergen and Trondhjem are well known cities. These cities are surrounded by industrial districts and are ports on the ocean. Sweden has several fairly large size cities. Stockholm, Goteborg and Malmo are seaports and they carry on considerable ocean trade.

The railroad lines in southern Sweden and around Christiania in Norway are very well developed, but outside of these areas they

* The name Christiania was changed to Oslo in January, 1925.

are not so numerous. The nature of the topography and the sparsity of the population do not favor railroads in many places. In certain sections other means of transportation are employed (Fig. 5).

THE LAPPS

Several thousand Lapps live in the northern and central parts of the Scandinavian Peninsula. They live mainly by raising reindeer, hunting and fishing, altho some depend upon agriculture for a livelihood. The so called Mountain Lapps live in the mountains during the summer. The so called Forest Lapps stay in the forest all the year.

Photo. Courtesy of W. A. Rowley

FIG. 5. Traveling over the hilly land of Norway

The nomadic Lapps generally live in conical shaped tents. The framework of the tent consists of light poles over which is usually stretched tent cloth or woven blankets. The tent is about six feet high, from twelve to sixteen feet wide at the base and about four feet wide at the top. On the floor in the center of the tent is a fire over which a kettle hangs. The smoke is supposed to escape at the top. There are no tables and chairs and the people sit and sleep on reindeer skins or sheep skins.

Some of the less nomadic Lapps live in permanent huts which are shaped like the conical tents. Other Lapps live in wooden houses.

The people in winter usually wear two coats, one of the coats having the fur next to the body and the other one the fur on the outside. A leather belt is sometimes used to tighten or loosen the coat. Tight trousers and moccasins stuffed with hay and

fastened to the trousers are worn. Caps are worn, but they differ according to the district from which the Lapp originally came. In summer, leather clothing is used to a certain extent.

The Lapps employ the reindeer as a beast of burden in summer and to pull the sledges in winter. The reindeer is not used generally for riding. The sledge usually has one runner. It is drawn by a reindeer. One end of the trace is fastened to the sledge and the other end to a loop around the neck of the animal. The trace passes between the hind legs.

Until a few years ago, the Lapps depended almost entirely upon the reindeer for their food. The milk, meat, blood and marrow from the bones were eaten. The reindeer cow produces a very small quantity of milk but it is very rich. Since the animal is only partly tame, it is rather difficult to milk.

Today, the Lapps still rely to a certain degree upon their reindeer and the wild plants for the necessities of life. Wild berries are sometimes gathered. Nevertheless, many of the Lapps depend upon traders for a part of their food and clothing.

The future of the Lapps is somewhat uncertain. There is a conflict between the pastoral Lapp and the settled farmer. Again, it is difficult for nomadic people to understand the full meaning of boundary lines between countries. They cannot see why they should not be permitted to cross from one country to another in search of food for their animals. The Scandinavian countries have made special laws concerning the rights of the Lapps. The Lapp problem is one which should be studied carefully by Norway, Sweden, Finland and Russia.

Again, as the Lapp comes into contact with the white man's civilization, there is a tendency for him to stop his nomadic ways and to settle down. Some people believe that the Lapps should be encouraged to remain nomadic and to depend chiefly upon the reindeer for their living. The products of the reindeer, such as meats and hides, are in demand by the civilized countries. The Lapps would have little difficulty in trading their surplus products for the things which they need. With this in view, the teachers who instruct the children try to impress upon the minds of the Lapps the importance of their mode of life. A nomadic Lapp is by no means a savage.

GEOGRAPHIC PRINCIPLES IN THE STUDY OF CITIES*

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GEOGRAPHIC PRINCIPLES AND GEOGRAPHIC FACTORS

For the purposes of this discussion a *geographic principle* may be defined as *a fundamental truth concerning the relationships existing between man's activities and his natural environment.* A *geographic factor* may be defined as *an element of the natural environment which influences the activities of man.*

The following contrasted statements set forth fundamental distinctions between these two related ideas.

A *geographic factor* is a material phenomenon; a *geographic principle* is a mental concept.

A study of *geographic factors* and their operation leads to the discovery and statement of *geographic principles.*

Man is conscious of *geographic factors* and their operation at all times; he is conscious of *geographic principles* only when he perceives the operation of a general law.

A *geographic factor* is individual and concrete; a *geographic principle* is general, intangible, and abstract.

A *geographic factor* is discernible to the physical senses; a *geographic principle* is discernible only to the mental processes.

A *geographic factor* may be observed as a specific thing; a *geographic principle* is a generalization which must be seen in wide operation in order to be appreciated.

In the study of cities, geographic factors are seen to be operative at every step in the location, development, and present status of each individual city. Geographic principles as related to cities begin to appear as the study proceeds, and as the student begins to perceive general truths which enable him to see that man's propensity for the building of cities is definitely related to the various elements of the natural environment in which the city is located. A systematic and comprehensive study of cities provides one of the most fruitful opportunities to investigate definitely and con-

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cretely the relationship which exists between man's activities and his natural environment. This study may begin in Home Geography with an investigation by the pupils, under the guidance of the teacher, concerning their home town and near-by towns which they may have visited. The study is then extended and continued in all regional studies thruout the course in geography. This study of cities from the point of view of geographic factors and geographic principles which calls for constant comparison and for systematic organization of new ideas, may develop for pupils one of the most important lines of thought of direct and constant value in post-school days.

IMPORTANCE OF CITIES IN THE STUDY OF GEOGRAPHY

The geography of any region is interpreted in large measure thru a study of its cities. The cities of a region are interpreted geographically only as they are related to the surrounding country, to each other, and to distant regions. A study of the distribution of the cities of a region and of their population reveals much about the industrial and commercial importance of the area. A comparison of two regions with reference to their cities suggests basic geographic factors operating in both regions. A geographic study of any city, large or small, involves definite consideration of the local suroundings and the connections with more distant places. Every city and village serves the people of the immediate vicinity and are, in turn, served by them. Every community serves more distant communities and also is served by them. Modern methods of transportation have developed an interdependence of distant communities not possible in earlier times. The people of today in the smallest village, or in the most remote community in our land, would find themselves seriously inconvenienced if all exchange of service with the rest of the world ceased for a few days or a few weeks. They would find themselves in dire distress, and adjustment to existing conditions difficult, or even impossible, if this isolation became permanent. This close and vital cooperation among peoples has been emphasized in modern times by the development of rapid, cheap, and continuous transportation thruout the civilized world. The rapid growth of numerous cities and villages, so located as to serve the needs of their own localities, has been a natural development based upon the operation of modern transportation facilities both by land and by sea.

The geographic principles here considered are applied to the cities of North America, but the same principles are applicable also to the study of cities of other continents.

SOME MINOR FACTORS IN THE LOCATION OF CITIES

In the early settlement of North America by Europeans, and in the westward movement across the continent, town sites were often chosen because of their military or strategic value. The fortress of Louisburg, at the easternmost harbor of Cape Breton Island, was of utmost importance thruout colonial history on account of its outstanding strategic position. Manhattan Island, on which New York City was founded, possessed a location of great military significance. The site of Pittsburgh was recognized by two rival nations as the military key to a great extent of valuable territory. Fort Dearborn on the bank of the Chicago River guarded the easiest pathway from Lake Michigan to the Great Central Plains. These are only a few of the many town sites in North America selected at first because of their strategic value.

Political influence has been an important factor in the location and growth of a few large cities and many small towns in North America. The selection of the site of our national capital was made under the specific direction of governmental forces. The early efforts in many states for the permanent location of the state capital sometimes became acute political issues in the state legislature. In many counties, the contests for the permanent location of the county seat have been long and spirited, usually ending when a building, adequate for the needs of county government, was erected at public expense in one of the competing towns.

A few cities owe their location and growth, and others their increased importance, to religious considerations. Nauvoo, Illinois, was a small village prior to 1840, when the Mormons selected it for a settlement. Within four years, Nauvoo had a population of 16,000. The importance of this town site decreased with the emigration of the Mormons from Illinois to Utah, and the population of Nauvoo, in 1920, numbered only 972. It was the religious motive which led the Mormons, in 1847, to Utah where Salt Lake City and numerous other communities in the Plateau States have been developed by them. In 1902, John Alexander Dowie and his religious followers founded Zion City, Illinois, in the open country near Lake Michigan. In 1920, Zion City had a population of 5,580.

These and other minor factors determining the location and growth of cities are of interest to the student of geography and history, but they operate in a very limited way in comparison with those factors which have influenced the location and growth of the greater number of cities of the modern world.

THE MAIN FACTOR IN THE LOCATION OF CITIES

The people of all cities must be able to obtain a living in the city year after year. A city or village can be founded only where there is opportunity for groups of people to secure food, clothing, and shelter thru cooperation among themselves and with people outside. No city, town, or village is self-sustaining within its own area. Its people can exist as a group only by having convenient and constant economic connections with the people of the immediate locality and of more distant regions.

These necessary external connections demand adequate transportation facilities to insure the people of the city or village against a shortage of supplies or unnecessary delay in the movement of people and commodities to and from the town. The very life of any town, large or small, depends on the existence and constant operation of transportation lines. These transportation routes may consist merely of wagon roads leading from a village to the farms of the region and across the country to other towns. Highways may be supplemented by railroad, canal, or navigable river. There may be a number of railroads leading in many directions. Railroad service may connect with steamship lines on river, lake, or ocean. The size and prosperity of the city depends on its relation to transportation facilities and its opportunity to develop commercial enterprises in competition with other cities. The city must have ready access to productive areas from which to draw food supplies and raw materials for manufacture. Access to markets is necessary, also, for surplus raw materials of the region and for manufactured products. The complete coordination of modern facilities for transportation of commodities gives a city possible connection with the most distant regions of the earth.

Long journeys with frequent transfer in method of transportation and in ownership are taken by many objects of common use, such as tea, coffee, bananas, rubber, fur, spices, silks, brazil nuts. Shorter journeys carry to us fresh vegetables, bread, meat, eggs,

corn products, cotton cloth, coal, lumber, and other articles produced in our own country.

Whenever commercial products are unloaded, stored, and again shipped, there exists a "break in transportation." At the place where this break in transportation occurs, people are required to handle the goods and to provide for storage. The goods may change ownership at this place of transfer and this requires banking facilities for financial operations. The people who handle the goods must be provided with food, clothing, and homes. This requires the presence of people who keep stores, build houses, and do many other kinds of work. If the break in transportation is an important one, the amount of goods to be handled and the number of people employed increase; the financial interests grow; manufacturing is developed; and a city is established. The size of the city and the rapidity of its growth depend on the amount of commerce and manufacturing developed at or near the break in transportation. The geographic principle involved in the commercial and industrial development of cities has been well formulated as follows:

"Population and wealth tend to collect wherever there is a break in transportation." [1]

The same principle may be stated for use of pupils as follows:

Cities tend to develop wherever there is a break in transportation.

The main factor in the location, growth, and prosperity of most cities of the world is the combination of natural conditions, supplemented by man's activities, which has led to the establishment of the required means for handling goods at a "break in transportation." If this geographic principle is clearly developed, simply stated, and concretely applied in the teaching of geography, much of the interesting, abundant, and valuable geographic knowledge of the cities of any locality and of the world may be organized about the principle.

The Principle Illustrated

The "break in transportation," and the tendency of population and wealth to collect there, is illustrated on every hand. As a person leaves his home to take the street car, he walks to the exact place where the city authorities and the street car company have

[1] Charles H. Cooley, The Theory of Transportation, p. 91

agreed to establish a "break in transportation" for discharging and receiving passengers. The manufacturer locates his plant near, or at, the point where the "break in transportation" takes place for receiving raw materials and for shipping the finished product. A small town with its grain elevator, a few stores, and a population of a few hundred people is established where the wagon roads lead to a convenient point on the railroad, at the "break in transportation" between highways and railroad. If the crossing of two or more railroads occurs at a suitable place for serving a well populated region, a village or city will develop. An increase in the number of railroad lines enhances the commercial importance of the city. A railroad center thus becomes an important break in transportation. Oversea commerce requires a transfer of goods from railroad or other means of transportation to ocean vessels. This necessitates an effective break in transportation, and large seaports are among the world's great cities. Every lake port, river port, and canal port, is located at a break in transportation.

A study of cities leads to the consideration of breaks in transportation occurring:

1. Between land transportation and water transportation.
2. Between two kinds of water transportation.
3. Between two kinds of land transportation.

Air transportation for governmental and commercial purposes is of interest, and contains future possibilities, but its present use does not influence greatly the importance of cities.

Air transportation, however, has already established its connections with both land and water transportation.

A Study of Seaports

The greatest commercial cities of the world are located where land transportation meets water transportation. Every important seaport marks a "break in transportation" of the first order.

As the various regions of North America are studied, the chief seaports and inland cities should receive adequate treatment with reference to the geographic factors which have influenced their location, growth, and present development. In the study of the cities of any region, the seaports may be considered comparatively with reference to:

1. Population
2. Character of the harbor and harbor improvements
3. Access to foreign markets
4. Local production of raw materials for export
5. Transportation facilities to more distant regions of the homeland
6. Manufacturing interests
7. Reasons for the present importance of the largest port

A study of each region, or each group of states, thus gives opportunity to investigate the seaports by a series of simple problems:

1. What are the seaports and what is the exact location of each?
2. What is true of each seaport, concerning topics 1 to 6 given above?
3. Which is the largest seaport and what are its advantages over the others?

The geography textbook, used as a reference book, provides sufficient information on most of the topics. Added information may be obtained from supplementary readers, gazetteers, annual almanacs, encyclopedias, atlases, and other sources. A study of the seaports of the Middle Atlantic States brings into consideration a group of cities, alike in that they are all seaports, but they differ in the operation of the factors which gives to each its present importance. It is this study of likenesses and differences among selected cities, that tends to develop a permanent knowledge of the geographic significance of any city. In making a study of this group of seaports, the pupils may develop a summary similar to the following:

New York is the largest seaport of the United States, because:

1. It has an excellent harbor.
2. Before railroads were built, New York had water transportation to the Central States thru the Hudson River, Erie Canal, and Great Lakes.
3. Some of the railroads from New York to the Central States follow the Mohawk Valley, and thus avoid crossing the Appalachian Highland over mountain ridges.
4. It is near the coal fields of Pennsylvania.
5. It and its suburbs form the greatest manufacturing center in the United States.

In developing these statements about New York, it is desirable to make direct comparison of New York with Philadelphia, Baltimore and Boston.

In the study of Canada, Quebec and Montreal may be treated in comparison with each other and with New Orleans and Portland, Oregon. These two Canadian ports are located on the same river estuary, far from the open ocean. An interesting problem may be developed by having pupils determine the distance of each from the Atlantic by using a large-scale map and measuring from the Strait of Belle Isle or Cape Breton Island. The populations of the cities may be found and compared. (In 1917, Montreal, 700,000; Quebec, 103,000.) This problem may then be derived by the pupils: *Why is Montreal seven times as large as Quebec, altho both are seaports and Montreal is farther from the Atlantic than Quebec?*

From textbook and other sources the two cities may be compared with reference to location for ocean commerce; access to commercial products of Canada, relation to parts of the United States, and other topics. The relative cost for carrying goods between these two cities on ocean vessels and on railroads must be considered. A comparison of these Canadian seaports with the seaports of the United States situated at considerable distances from the open ocean will aid in the study.

Some of the geographic principles which may be found in the study of seaports are the following.

Seaports tend to develop where there is a good natural harbor near a productive region.

Seaports tend to develop at a good natural harbor from which transportation lines lead far into the interior of the continent.

Seaports tend to develop where the natural harbor is poor, if the land of the surrounding region is highly productive.

Seaports tend to develop on rivers or on arms of the sea as far inland as ocean vessels can find deep channels and safe passage.

A Study of Lake Ports

On the shores of the Great Lakes of North America are found a greater number of large cities than on the shores of all other inland water bodies of the world. Among these lake ports are Toronto, the second city of Canada in population, Chicago, the second city of the western hemisphere, and the fourth city of the

world; Detroit and Cleveland, the fourth and fifth cities of the United States; Buffalo, Milwaukee, Toledo, Duluth, Erie, and Gary, large and flourishing cities. Each of these cities marks a break between land transportation and water transportation.

An investigation of lake ports furnishes basis for the following summary concerning the commercial leadership of Chicago among the lake ports.

1. Chicago was connected with the Illinois River by means of the Illinois and Michigan Canal before railroads were built.
2. Chicago is nearer the center of agricultural production than any other lake port.
3. The position of Lake Michigan required railroads between the East and the Northwest to center at Chicago.
4. There is an abundance of coal within easy shipping distance.
5. Chicago is second only to New York as a manufacturing city in the United States.
6. Chicago has become the greatest railroad center and the greatest lake port in the world because of its superior location for receiving and distributing goods both by land and by water.
7. With its many advantages of location and transportation, Chicago serves a larger area than any other lake port in the world.

Some of the geographic principles illustrated by lake ports are the following.

Lake ports tend to develop where the cost of transportation may be lessened by carrying, on waterways, articles of large bulk and small value. This is illustrated in the location of shipping ports for iron ore with reference to mines, and in the location of receiving ports for this ore with reference to centers for smelting; also in the location of shipping and receiving ports for grain, lumber, and coal.

A lake port develops wherever there is a break between lake transportation and rail or canal transportation. Chicago, Buffalo, and Cleveland are lake ports which had canal transportation in their early development.

A lake port tends to develop at the place where a stream enters the lake. Many lake ports illustrate this principle. The stream and its valley furnish opportunity for harbor improvement thru extensive dredging and building of docks.

A STUDY OF RIVER PORTS AND CANAL PORTS

Before railroads were built, the easiest method of travel from the coast to the interior of any continent was along navigable rivers. The early settlers followed the same routes as the explorers, and located their villages where they could make use of the streams for travel and for commerce. Later, settlers occupied the land a little farther from the rivers, but within easy reach of the river settlements. Every village along the bank of a navigable stream is located at a point which marks a "break in transportation" between land and water. The cities on the inner margin of the Coastal Plain, along the "Fall Line," may be best studied in this relation. Here, at the interruption of river navigation, arose the necessity of establishing a settlement which would serve the regions both below and above the Fall Line.

The cities on the Mississippi and on its navigable tributaries were chosen mainly because of the relation of the site to river commerce. New Orleans is both a seaport and a river port. It is located as far up the Mississippi as ocean vessels can ascend. Minneapolis and St. Paul are located at the head of navigation on the Mississippi, where power furnished by the stream above and transportation provided by the stream below combine to determine the exact location of the most populous center northwest of Chicago. Peoria, located at a relatively narrow place on the Illinois River, furnished an easier crossing than any point further down the Illinois River. Pittsburgh, located on three important rivers, is a focus for travelers and for trade moving across the Appalachian Highland.

Before the building of railroads, canals were constructed at great public expense as the best means of connecting and extending the commerce already developed on navigable rivers. Towns promptly grew up along this canal to handle the commerce of the region. Breaks in transportation between land and water and between two kinds of water transportation, before the period of railroad building, determined the exact location of the greater number of the present-day cities of North America.

Some of the geographic principles illustrated by river ports and canal ports are the following:

Cities tend to develop along rivers where the land is high enough to be above serious flood damage, but where access to the river front, and also to the uplands beyond the river valley, is easy.

Cities tend to develop at or near the junction of two navigable streams where transfer of goods is necessary.

Cities tend to develop on the outer curve of large bends in streams if there is easy access to the land area.

Cities tend to develop at or near the place where river navigation is interrupted by falls or rapids.

Cities tend to develop at points where rivers are easily crossed by ford, ferry, or bridge.

Cities tend to develop at the termini of canals.

Cities tend to develop at points along a canal suitable for assembling and distributing commercial products.

THE RAILROAD AND ESTABLISHED CITIES

An examination of a railroad map of the United States and southern Canada presents the larger cities as centers from which railroads radiate in many directions. Many of the important railroad centers of today were well developed commercial centers before railroads were built. Their sites had been determined by the necessities of transportation at an earlier date. Most of them were located at places where land transportation met water transportation, whether by sea, lake, river, or canal. The cheap, rapid, safe, and continuous transportation afforded by railroads stimulated the growth of cities already located at natural breaks in transportation. Railroads from New York found easy access to the Central Plains along the Hudson and Mohawk valleys without crossing a single mountain ridge. Railroads from Philadelphia and from Baltimore found more difficult routes to the Central Plains by going up the valleys on the east side, over the mountain ridges, and down the valleys on the west side of the Appalachian Highland.

Every railroad station marks a break in transportation between wagon road and railroad. The prosperity and growth of cities depending largely on water transportation were enhanced by the coming of the railroad. Railroads permanently stimulated water transportation by sea and by the Great Lakes. Transportation by river and canal which had thrived until completed railroad systems were established, declined, and, in many cases, ceased. River ports and canal ports favorably located for railroad service usually developed into more flourishing cities, because the railroad gave better transportation facilities than the canal, quickening the

movement of people and of goods and leading to more rapid settlement of new lands.

THE RAILROAD AS A FACTOR IN THE LOCATION OF NEW CITIES

The larger prairies of the Central Plains were not settled until after the building of railroads. Settlement took place with extreme rapidity when railroads carried lumber for the building of houses and barns on these treeless plains, and transported the abundant agricultural products to distant markets. Town sites were laid out at convenient distances to serve the people of the surrounding regions. These towns along the railroad were commonly not more than five or ten miles apart. Here were located the grain elevator, the blacksmith shop, the general store, and the post office as the nucleus of a village or possibly a city.

CITIES AND TOWNS IN MOUNTAINOUS REGIONS

The influence of land relief in determining the route of transportation lines and the location of cities is greater in a rugged or a mountainous area than in a region of extensive plains. Branch railroad lines and short connecting lines between the main lines serve communities among the mountains and on the plateaus. A mining center, an irrigated area, a grazing region, or a lumber district may originate profitable business for a branch line railroad. An examination of a large map showing all railroad lines of the Western States reveals numerous short lines extending from the main railroad and terminating at a small town among the mountains or on the plateau. Each of these small towns illustrates the principle that *towns tend to develop wherever there is a break in transportation.*

GEOGRAPHIC PRINCIPLES APPLIED TO CITIES LOCATED ON RAILROADS

The following are some of the geographic principles suggested by a study of the relations existing between railroads and the location and growth of cities and towns.

The first railroads were constructed from city to city along routes of travel which had been previously used.

Railroads promoted the growth of established cities because they brought cheaper, more rapid, and more reliable transportation service.

Railroads led to the establishment of numerous towns where none had existed before, and these new towns were usually placed

at such intervals as to eliminate long wagon hauls of heavy commodities.

None of the important cities of North America and only a small proportion of the villages are without a railroad.

Branch railroad lines are constructed from the main line into regions which assure profitable traffic.

Railroads are constructed across hundreds of miles of unproductive territory if the lands on opposite sides of the unproductive region have abundant commodities for exchange.

MANUFACTURING CITIES

The study of cities as manufacturing centers leads to a profitable study of "breaks in transportation." A comparison of the cotton manufacturing industry of New England and of the South with reference to the factors favoring manufacturing will serve further to relate the cities of two regions thru a common industry.

The study of iron and steel manufacture in relation to the factors involved leads to the association of cities widely separated in distance, but closely related in industrial development. Thus Pittsburgh, Pennsylvania, Birmingham, Alabama, Chicago, Illinois, and Gary, Indiana, may be considered in relation to each other.

Meat packing and the manufacture of flour are two industries which are effectively associated with the supply of raw materials. The leading cities in which these industries are carried on will mean more to pupils if the relation of manufacturing to a supply of raw material is clearly understood.

CITIES AND PLACE GEOGRAPHY

Cities as names have little meaning. Cities as centers of an important human activity with the reason therefor have definite and concrete meaning. It is this "geographic significance" of cities that adds vitality to "place geography," so often condemned; nevertheless "place geography" must ever remain as fundamental to the mastery of geography as the multiplication table to the mastery of arithmetic. The remedy lies not in its condemnation but in its vitalization thru associating with the place name all the information of its human interest and of its geographic significance.

RESPONSIBILITY

Our attention is called frequently to a certain class of books—appearing under the title of geography—which contain a large amount of material that cannot possibly be classed as geography, e. g., the mechanical operation of an engine. These same books frequently state positive falsehoods, and very commonly create definite misconceptions. Their presence in the field of education is bad but their appearance under the title "Geography" also tends to crowd out good geographic material and thus prevent genuine geography from making the contribution that is exclusively its own. Our major textbooks on elementary geography are reasonably free from such material but our supplementary books contain an inexcusable amount. An early text in geography described southern Michigan as a malaria infested swamp fit only for wild animals. This undoubtedly represented the best information available at the time. Such an excuse does not hold for the class of material cited since the truth is available. Ignorance and the lack of regard for truth are the only excuses.

The fact that an author is a school principal, professor, president, or teacher, in a given institution is not sufficient proof that he is qualified to write on a given subject. His specialty should be revealed. It is safe to look with suspicion upon any school book author who fails to reveal his identity. However, if he is a "professor of education" we are expected to assume that he is an authority on every subject, or that he does not need to really know anything about a particular subject in order to write with authority upon it. There are conspicuous exceptions to this rule and their works should receive serious consideration. Unfortunately, the field of "education" seems to contain a surplus of "exspurts." Apparently this field has an affliction similar to that of geography but more difficult to diagnose.

It is little short of a crime to place in a child's hands a book containing many untruths and misleading statements. College students are constantly confronted with the painful task of "unlearning" a formidable array of geographic "facts" and concepts taught them in childhood. There is little hope for reform among authors of such books until the public becomes more discriminating. Therefore, the responsibility must rest upon teachers and superintendents. It is their duty to ascertain the qualifications of

an author before adopting a book. They would not think of employing a dentist to perform an operation for appendicitis. Neither would they employ a surgeon without first determining his qualifications. The training of children to make them efficient citizens is entitled to equal consideration. School men and women are under obligations to determine the truthfulness of material presented to children. Therefore, scrutinize the author's qualifications and, especially the contents of his books. G. J. M.

GEOGRAPHICAL PUBLICATIONS

Charles E. Neville. **Our Continent and Its Neighbors.** An American Geography. 130 pp., 6 maps, 65 photos. Hinds, Hayden and Eldredge, Inc., New York. 1924.

This small volume of 130 pages covers the entire western hemisphere; eliminating pictures (65) and full page maps (6) there are about 100 pages of text. The author has packed this space with a well selected mass of material. Of necessity, many statements are highly generalized—so much so that in some instances they lead easily to inaccuracies of thought.

The book is intended for the elementary grades, and it aims to give the essential facts and principles necessary for an intelligent understanding of life in this hemisphere. It is based on the continent study plan of presentation so common in many of our school textbooks, but it is superior to many of these, particularly in the restraint exhibited in the use of place names.

The author speaks in the preface of "only the smallest necessary amount of text" as an objective, and this explains the small size of the volume. On the other hand, the reviewer has found among elementary grade pupils, who by the use of projects have become inured to thinking, an avidity for expansive and full descriptions in order to illustrate accurately by models and drawings their particular projects.

Rhode Island College of Education, R. M. BROWN
Providence

Ethel I. Summy and Walter J. Young. **History-Geography Syllabus for Elementary Schools.** *Bulletin,* State Normal School, Fredericksburg, Va., Vol. VIII, No. 4, Dec., 1922.

This syllabus is a representative of the better class of outlines in geography, in that the topics are sufficiently expanded to be suggestive. The regional groups are used as units thruout and in each area, the significant historical development as well as the geographical is indicated for study. Problems and projects are inserted—some outlined and others merely suggested. The syllabus is particularly rich in its discussion of the Virginia neighborhood (pages 39-94) and this portion should be useful in other states as a line of procedure in contrast to that offered by the impossible "State Supplements."

While it must be remembered that few outlines can be used apart from the conditions for which they are intended, this syllabus can be recommended to teachers who are looking for suggestions and new lines of development.

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Stephen Sargent Visher. **Climatic Laws, a Summary of Climate.** 96 pp., 9 maps and diagrams. John Wiley & Sons, Inc., New York. 1924. $1.50 net.

Readers of the *Journal* are familiar with Dr. Visher's excellent suggestions embodied in his article, "Preparation for Teaching Climate," [Vol. 20, (Oct., 1921), pp. 252-264], while those who have benefited from the points he makes have wished for a more complete presentation in readily available form. Dr. Visher's new book, "Climatic Laws," is just what is required. Textbooks on Climatology are scarce, and mostly in a foreign language. Ward's excellent translation of Hann's, "Handbook of Climatology" (out of print), is for the specialist rather than for the general geography teacher. Professor R. DeC. Ward's book, "Climate, Considered Especially in Relation to Man," is a science reader rather than a text. For its excellence of brief presentation of some phases of general climatology, this volume is unique. Professor Visher's compilation and codification of general climatology, in fair detail and with copious references for further reading, provides the teacher with the much needed concise statements of facts and principles of climatology.

"Climatic Laws" is divided into five chapters: meteorological laws, temperature laws, laws concerning winds, moisture, and miscellaneous. The first, a brief chapter, is inadequate in comparison with the rest of the book. The statements are too brief, and they are without supporting references. The omission of conduction as a factor in heating and cooling of the lower air is surprising, since it is more important on many occasions than is radiation to which almost exclusive attention is given. The climatic laws, on the contrary, that form the bulk of this convenient book, have been carefully considered and have been checked by several, till they are reasonably free of inaccuracies, and sufficiently comprehensive for the teacher's use.

Clark University CHARLES F. BROOKS

John Batholomew. **The Oxford Advanced Atlas.** 127 pp., 96 map plates. Oxford University Press, American Branch, N. Y. 1924. $3.50.

When Bartholomew produces a map or an atlas it is likely to rank among the best. The new "Oxford Advanced Atlas" maintains this reputation. The physical maps are excellent and carry a vast amount of political detail without seriously obscuring the whole. Each continent is given physical, seasonal temperature and rainfall, density of population, and vegetation maps, and in some cases economic, geologic, and race maps are included. The plates are 8¼ x 13½ inches and many maps occupy two plates, thus providing space for showing details clearly. British possessions, of course, receive the greater emphasis. Twenty-four plates are devoted to astronomical charts and to world maps; 33 to Europe; 12 to Asia; 7 to Africa; 8 to North America; 4 to South America; and 5 to Australia and New Zealand. An index of 31 pages gives over 11,500 place names together with the latitude and longitude of each.

Nellie B. Allen. **How and Where We Live.** 282 pp., 121 colored plates and photos. Ginn & Co., Boston. 1924. $0.88.

"How and Where We Live" is a new member of the excellent series of supplementary geography texts by Miss Allen. It is written as a simple narrative for third grade children and includes studies of food, clothing, shelter, trade, transportation, and stories of children's homes in distant lands. The book is divided into three major parts: Home Life and Needs; Our World Neighbors; and Our Own Country. A series of questions at the beginning of each narrative is designed to focus the child's attention upon the more important points.

New Relief Map of Alaska. The United States Geological Survey has prepared a new relief map of Alaska in which the mountains and valleys are indicated by brown shading. The waters and glaciers are shown in blue and the names and other man-made features in black. The map, which measures 30x50 inches in size, is essentially a wall map and represents the results of 25 years of topographic work in Alaska by the Survey.

The base was compiled by R. H. Sargent and the shading to show relief was done by John H. Renshawe, who uses this form of topographic presentation in a masterly manner.

This map, known as Map D, can be purchased for 50 cents from the Director of the Geological Survey at Washington, D. C. It should not be confused with a map of Alaska on the same scale (Map E), issued in 1923, which is sold for 25 cents and which does not show the relief. In this new relief map many of the geographic names that are shown on the older map have been eliminated to avoid obscuring the representation of the topography. On this account, the older map (E, 1923) will probably best serve for ordinary commercial use, but the new one (D, 1924) is best adapted to the use of those who desire a picture of the topography of Alaska.

O. E. BAKER, Agricultural Economist

Washington, D. C.

Preston E. James and R. Burnett Hall. **Outline for a Course on the Principles of Geography.** 112 pp. Edwards Bros., Ann Arbor, Michigan. 1924. $2.00.

This is a synopsis of the elementary course in geography as developed at the University of Michigan, being in considerable part a revision and modification by the present authors of an earlier outline. Part I deals with the various factors of the environment complex; Part II consists of studies of nine selected type areas together with a comparative regional study of the "three principal centers of industry."

The outline, altho ambiguous in some portions, represents the result of extended experimentation over a period of years and should, in connection with other outlines of similar character which have appeared recently, assist in clarifying the situation as to the minimum essentials for the elementary course in geography.

University of Minnesota D. H. DAVIS